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tioned in my Desmids of the United States, p. 145. The semicells are smooth, broadly elliptic, with the angles terminated by two, long, stout, subulate spines.

Lyngbyapapyrina, Kir. (*Phormidium papyraceum*, Ktz.)—Collected by W. A. Setchell, New Haven, Conn.

Oscillaria chalybea, Mertens. Florida.

Beggiaboa leptomitiformis, Trevis.—Collected by Miss G. Lewis, Clifton Springs, N. Y. April, 1885.

Spirulina tenuissima, Desmaz.—Frequent in sulphur springs, Green Cove Spring, Florida, and Clifton Springs, N. Y.

The Origin of Herbaria.*—At a meeting of the Botanical Society of Lyons, May 5th, 1885, Dr. Saint-Lager gave the results of the researches that he had made regarding the historical origin of herbaria. He had been led to this study by reading a work recently published by Messrs. Camus and Penzig upon the subject of a herbarium of the end of the sixteenth century discovered in the archives of Modena. In the first place, Dr. Saint-Lager stated that in the writings of the naturalists of antiquity no collection of plants that had been first dried and pressed and then united in volumes is ever spoken of. Yet it is certain that among the Greeks there were *botanologoi*, who, as the name indicates, devoted themselves to the gathering of plants. These persons were called also *rhizotomoi*, 'root-cutters,' and it was their business, particularly, to stock the shops of the *phytopolai*, or herb-dealers, called in Latin *herbarii*.

We know also that a botanical garden was established at Athens by Aristotle, and afterwards ceded to Theophrastus his pupil, and his successor at the Lyceum. Theophrastus bequeathed his garden, natural history museum and dwellings to his disciples. Pliny tells us that he often enjoyed visiting the garden wherein the venerable Antonius Castor cultivated all the plants of Italy, Greece, Asia Minor, Egypt and India. There was also a botanical garden near the celebrated School of Medicine of Alexandria. Later on, in the middle ages, the centre of phytological studies was transferred to Salerno, where Matthæus Silvaticus founded a garden which served as a model for all those that were established in several towns of Italy, Holland, Germany, England, Russia and France.

As botany, on account of the numerous applications formerly made of it in medicine, was, among the natural sciences, the one that had most adherents, it seems surprising at first sight that the art of preserving plants, dried and pressed, did not keep pace with that of cultivating them, and that Linnæus's aphorism that *omni botanico herbarium necessarium est* has not from all times been a fundamental clause in the cartulary of botanists. It is well to remark that the word *herbarium*, which might prove misleading, was used up to the middle of the sixteenth century to designate a botanical treatise accompanied with engravings opposite the text. Such is the *Herbarium* of Apuleius Platonicus and that of Giacomo Dondi, *Le Grant*

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*From the *Bulletin trimestrial de la Société botanique* de Lyon, April–June, 1885, p. 61.

Herbier in French translated from Latin, the *Herbarium* of Brunfels, the *Herbario Nuovo* of Castore Durante, and several others of the same kind. The expression *hortus siccus*, 'dry garden,' by which was designated what we now call a herbarium, did not make its appearance until towards the end of the sixteenth century, and, on another hand, the most ancient herbaria preserved up to our day are those of the Lyonais surgeon Gréault (1558), in the Paris Museum, of Aldrovandi (1560–68), in 16 volumes, at Bologna, of Rauwolf (1573–75), at Leyden, of an unknown botanist, in the archives of Modena, and of Gaspard Bauhin (1576–1623), at Basel.

Dr. Saint-Lager gave a description, from Messrs. Camus and Penzig, of the Modena herbarium, and, from Mr. Caruel, of the much more extensive one of Cæsalpinus, and he expressed his regrets that so little care had been taken of the herbaria formed by Lyonais botanists. No trace of Daléchamps's collections remains, and there are but a few fragments of those of Goiffon, who had the honor of being Jussieu's master. The herbarium of Claret de la Tourrette has, with the exception of the lichens, been distributed through the general herbarium of the Conservatory. No one has ever had the curiosity to visit the herbarium of Abbot Rozier. Finally, there has recently been found at the Conservatory of Botany a herbarium which was formed in 1699 by an apothecary named René Marmion, and which, on account of its antiquity, should have merited a better fate than that of being devoured by parasites.

It now remains to examine a question to which no one has ever paid any attention, and that is why herbaria were not formed before the sixteenth century? Assuredly it was not because the invention required a great effort of genius. Even children, without being taught, know how to form little herbaria by inserting flowers between the pages of a book during their walks in the fields. This word *book* contains the answer to the question proposed. The ancients did not prepare herbaria because they did not know the art of uniting into book-form sheets of that admirable material, paper, which, although very thin, is relatively quite stiff. They wrote upon papyrus, or upon sheets of parchment which they *rolled* into a volume (*volumen*, from *volvere*). Moreover, they would never have ventured to employ papyrus, a costly material, nor even parchment, for so vulgar a purpose.

In the twelfth century of our era the manufacture of paper from silk (*charta bombycina*) and from cotton (*charta cotonea*) was begun in Europe, according to processes long understood by the Chinese; but it was not till the fourteenth century that it was known how to make paper out of linen and hempen rags. And then, as all the operations were performed by hand, paper was quite a dear product. When, about the middle of the fifteenth century, the art of printing was invented, paper manufacturers taxed their ingenuity to reduce the cost of labor, and constructed machines adapted for comminuting rags and spreading the pulp in the form of endless sheets. Now it is worthy of remark that the appearance of herbaria coincides with the mechanical improvements by means of which it became possible to manufacture paper at a low price. Such economic result once obtained, the idea of preserving dried plants must have occurred to several botanists at the same time; and it seems to be useless to discuss at length the question as to whether the inventor of the forming of herbaria was Luca Ghini, as maintained by Meyer in his Geschichte der Botanik, or the Englishman Falconer, as thought by Messrs. Camus and Penzig. In fact, said Dr. Saint-Lager, the Lyonais surgeon Gréault formed a herbarium at the same period as did Ghini and Falconer, and without having been in communication with them. It is probable that other botanists likewise have simultaneously carried out the very legitimate desire of preserving in their library those plants which they had taken so much pleasure in gathering in a living state. The difficulty did not consist in conceiving of the idea of collecting dried and pressed plants together into a volume, for that is child's-play, but rather in finding a convenient and cheap mounting material.

Botanical Notes.

Red Snow.—At a recent meeting of the Biological Society of Washington, Mr. Romyn Hitchcock, of the National Museum, read a paper on Red Snow, and exhibited through the microscope specimens of the brilliant, minute, crimson globules which give color to the snow, and about the character of which there has been considerable difference of opinion among naturalists. Mr. Hitchcock remarked that the red snow that attracted much attention from scientific gentlemen when it was brought home from the Arctic regions by Capt. Ross, in the year 1818, was by no means unknown before that time. De Saussure, as early as 1760, observed it on Mount Breven, in Switzerland, and since then many others have noticed it in the Alps and Pyrenees, and it seems to occur frequently in all parts of the world. Particular interest, however, was manifested in the material brought home by Capt. Ross, and several botanists secured specimens for examination, and, among these, Mr. Francis Bauer, who thought the plant a *Uredo*, and named it *U. nivalis.* Baron Wrangel regarded the plant as a lichen, and gave it the name of *Lepraria Kermesina.*

In the latest literature of algæ the plant is classed as a *Chlamydococcus.* Until the method of propagation of this plant is more satisfactorily established, Mr. Hitchcock thinks it will be impossible to fix its systematic position. It is not improbable that in its actively vegetating condition the plant is green. This is indicated by the observations of early discoverers.

A specimen of the red snow collected by Dr. Kane from the crimson cliffs of Beverley is in the National Museum, but is now thoroughly dry.

A specimen sent by Mr. Alexander McDougall was received in January of this year from Poverty Gulch, Col.

Mr. Hitchcock made a few observations on this and attempted to cultivate some of the cells, but without success. The cells were of a bright red color, sometimes apparently quite naked, but frequently enclosed singly or three or more together, in a colorless, shrivelled envelope.